

REMARKS

Reconsideration of the present application is respectfully requested. Claims 1-13 are pending in this application. Claim 11 is amended to provide consistency of language with claim 10, from which claim 11 depends. The amendment to claim 11 is believed to overcome its rejection under section 112 paragraph 2.

Claims 1-13 are rejected under 35 U.S.C. § 112 paragraph 2 for allegedly failing to particularly point out and distinctly claim what Applicants regard as their invention. The rejection stems from describing the claimed subject matter as “fluorescence-type” phosphors. The Applicants respectfully disagree that the amendments render the claim indefinite. “Fluorescence” has a clear, definite, and, as explained below, distinguishing meaning. “Fluorescence” is “the emission of electromagnetic radiation, especially of visible light, stimulated in a substance by the absorption of incident radiation *and persisting only as long as the stimulating radiation is continued.*” See <http://dictionary.reference.com/browse/Fluorescence>, last visited April 21, 2010. (Emphasis Added). Further, the meaning of “Fluorescence” was explained by the Applicants in their prior Response, filed July 9, 2009. There, the Applicants noted that a characteristic of fluorescence is that luminance intensity quickly decreases to zero as soon as UV irradiation (excitation) is stopped. Applicants incorporated a figure in their prior Response showings that light emission (“afterglow”) stops in 10 milliseconds after ending irradiation. Moreover, Applicants specifically describe their inventive phosphors as fluorescence-type phosphors in the specification, at, for example, page 7, lines 8-9, page 10 lines 30-32, page 18 line 10, and page 43 line 29. The luminescence characteristics of Applicants’ inventive phosphors were measured with a fluorescence spectrophotometer, see page 19 line 34, which measures

fluorescence characteristics. Accordingly, the meaning of “fluorescence” is well understood by the skilled artisan.

In view of the above, the Applicants respectfully submit that the rejection is overcome, since it appears that the meaning of “fluorescence” has a well-defined meaning in the art.

Claims 1, 4-7, and 9 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over Oshio et al., U.S. Patent No. 6,096,243 (“Oshio”) in view of Morihito et al., JP 2000-144129 (“Morihito”). Claims 2, 3, 8, and 10-13 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over Oshio in view of Morihito, and further in view of Bouchard et al., U.S. Patent No. 3,753,759 (“Bouchard”). It is respectfully submitted that the combined teachings of Oshio and Morihito in fact teach away from the claimed subject matter. Accordingly, the section 103 rejections are overcome.

The claimed alkaline earth metal aluminate fluorescence-type phosphors contain bivalent europium as an activator and further include element (e), an element selected from the group consisting of indium, tungsten, niobium, bismuth, molybdenum, tantalum, thallium and lead. Alkaline earth metal aluminate phosphors containing bivalent europium as an activator generally deteriorate and decrease in luminance after prolonged exposure to elevated temperatures or ultraviolet radiation. Applicants have unexpectedly discovered that element “(e)” serves to prevent deterioration of luminance caused by heat, oxidation, or ultraviolet radiation. Thus, the inclusion of element (e) contributes to improved durability. The effect is demonstrated in the examples of the instant specification (see Tables 1 to 5). As a result, a display device containing the phosphors of the present invention will work for a longer period without deterioration of luminance.

Seemingly, the Examiner does not give credit to the improvements

demonstrated by the Applicants, at least not to a degree that influences the patentability determination. It seems that it is the Examiner's position Morihito, which allegedly teaches the inclusion of include Nb as a coactivator in the phosphorescent material, that the improved durability recognized by the Applicant would "flow naturally" from the presence of Nb in the phosphorescent material. The Examiner relies upon the *Obiaya* decision to support that proposition. The Applicants respectfully disagree with the Examiner's conclusion.

The Applicants do not agree with the Examiner's reading and application of Morihito to the claimed subject matter. Morihito teaches 28 possible coactivating compounds, of which only 3 of the 8 element (e) compounds recited in claim 1 of the present application are represented by Morihito's teachings. See the abstract of Morihito, and claims 1 and 2 of same. Accordingly, it is only with hindsight, apprised of the teachings of the subject matter presently claimed, that the skilled artisan would chose Nb as the coactivator. There is no teaching or suggestion that Nb should be selected from among the 28 coactivating compounds disclosed in Morihito for inclusion in a phosphor containing barium and/or strontium; magnesium; aluminum, and bivalent europium as an activator. Further, Applicants submit that it is incorrect to regard Nb as a preferred compound for a phosphor containing the aforementioned elements of the claimed phosphor. All Morihito merely disclose is that when the phosphorescent material is *specifically, a calcium aluminum oxide*, then Nb should be employed. Thus, in actuality, Morihito teaches something vastly different than what is recited in the claimed subject matter. Thus, it seems that only with reliance upon impermissible hindsight would the person of skill in the art select Nb as the 1 of 28 potential compounds to serve as the coactivator in the presently claimed phosphors.

Furthermore, it is submitted that Morihito teaches away from the claimed

subject matter, since the specific teaching of the reference with regard to Nb is that it works well in calcium aluminum oxide phosphors. Thus, Morihito teaches the person of skill in the art to employ calcium aluminum oxide phosphors, which are not the phosphors containing barium and/or strontium, etc., that are the subject of the claimed subject matter.

From the above, it follows that the Examiner's position that the unexpected result naturally flows from the combined teachings does not apply here. In the *Obiaya* case cited by the Examiner, the prior art suggested use of the element specifically employed in the claimed combination. In other words, the differences were otherwise obvious. That is not the case here, as it is highly unlikely that the person of ordinary skill in the art would select Nb from Morihito's list of 28 elements, in order to arrive at the claimed invention. Thus, the present invention is not obvious in view of the combined teachings, and in Applicants' view, the *Obiaya* decision is clearly distinguishable in view of the facts presented herein.

Further, it is submitted that a combination of references that includes Morihito teaches away from the present invention for additional reasons. As indicated, the claimed subject matter is directed to fluorescence-type phosphors. In other words, the phosphors emit radiation only as long as the stimulating radiation is continued. Morihito, on the other hand, teaches a phosphorescent material, which is entirely different from the phosphors taught by the present invention. Morihito itself makes clear that its disclosure concerns materials that are fundamentally different from the claimed subject matter. Specifically, Morihito indicates that its subject phosphorescent material has "afterglow for a long time". See the abstract of Morihito. Similar statements appear throughout the Morihito reference.

It is well understood in the art that phosphorescent materials, such as

those materials taught by Morihito, is entirely different from fluorescent materials, which are the subject of the claimed subject matter. Phosphorescence is a process in which energy absorbed by a substance is released relatively slowly in the form of light. Thus, the person of skill in the art would recognize that the subject of Morihito is completely different than the claimed subject matter. Thus, it is submitted that a combination of references that includes Morihito results in the making of a phosphorescent material, not a fluorescent material. Accordingly, such a combination teaches away from the claimed subject matter.

Accordingly, for the reasons set forth above, it is respectfully submitted that the rejections are overcome.

REQUEST FOR EXTENSION OF TIME

Applicants respectfully request a three month extension of time for responding to the Final Office Action and filing a Notice of Appeal, which accompanies this paper. The fee of \$1110.00 for the extension is provided for in the charge authorization presented in the PTO Form 2038, Credit Card Payment form, provided herewith.

If there is any discrepancy between the fee(s) due and the fee payment authorized in the Credit Card Payment Form PTO-2038 or the Form PTO-2038 is missing or fee payment via the Form PTO-2038 cannot be processed, the USPTO is hereby authorized to charge any fee(s) or fee(s) deficiency or credit any excess payment to Deposit Account No. 10-1250.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,
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